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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/717,591	11/21/2003	Masahiro Sunohara	031274	9394

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ARMSTRONG, KRATZ, QUINTOS, HANSON & BROOKS, LLP
1725 K STREET, NW
SUITE 1000
WASHINGTON, DC 20006

EXAMINER

SEMENENKO, YURIY

ART UNIT	PAPER NUMBER
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2841

DATE MAILED: 12/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

H.A

Office Action Summary	Application No.	Applicant(s)	
	10/717,591	SUNOHARA ET AL.	
	Examiner	Art Unit	
	Yuriy Semenenko	2841	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) 8-16 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>11/21/03</u> page 1. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Election/Restrictions

1. 1. Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-7 drawn to an electronic parts packaging structure, classified in class 174 subclass 260.
- II. Claims 8-16 drawn to a method of manufacturing an electronic parts packaging structure, classified in class 29 subclass 825.

The inventions are distinct, each from the other because of the following reasons:

1.2 Inventions II and I are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case product as claimed can be made by another and materially different process. For example, product could be made by a method of forming a via hole without etching by laser.

1.3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, and the search required for Group II is not required for Group I, restriction for examination purposes as indicated is proper.

1.4. During a telephone conversation with D. W. Hanson (Reg. No. 27,133) on November 9, 2005, a provisional election with traverse was made to prosecute the invention of group I, to an electronic parts packaging structure, Claims 1-7. Affirmation of this election must be made by applicant in replying to this Office action. Claims 8-16 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Claim Objections

2.1. Claims 1 and 6 are objected to because of the following informalities:

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In contest of claim 1 “on which an electronic parts” should be changed to – on which electronic parts—as a plural noun.

In contest of claim 6 “a bump of an overlying electronic parts ” should be changed to – a bump of overlying electronic parts -- as a plural noun.

Appropriate correction is required.

2.2. Claims 1 objected to because of the following informalities:

In contest of claim 1 after words “an uppermost film, and” insert –the electronic parts- for clarity claim.

Appropriate correction is required.

2.3. Claims 2-7 objected to because of the following informalities:

In contest of claims 2-7 “an electronic parts packaging structure” should be changed to – the electronic parts packaging structure -- for proper antecedence basis.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

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2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3.1. Claims 1, 3, 4, 5, 7 are rejected under 35U.S.C. 103(a) as being obvious over Akagawa (PGPAB #2001/0010627 hereinafter “Akagawa”) in view of Osawa et al. (PGPAB #2001/0011767 hereinafter “Osawa”).

3.1.1. Regarding claim 1: Akagawa discloses in Fig. 4 an electronic parts packaging structure 50 comprising: a mounted body 61 on which an electronic parts 70 is mounted; the electronic parts 40, Fig. 3C having a connection pad (page 3, [0045]), and mounted on the mounted body to direct the connection pad upward; an insulating film 63 for covering the electronic parts; a via hole VH, Fig.1 formed at least in a predetermined portion of the insulating film on the connection pad of the electronic parts (page 3, [0045]); and a wiring pattern 29 connected to the connection pad via the via hole VH,

except , Akagawa doesn't explicitly teach pad is constructed by a laminated film to have an etching stopper film as an uppermost film.

Osawa discloses pad is constructed by a laminated film Fig. 9A and (page 4, [0063], [0065], [0071]) to have an etching stopper film 22 as an uppermost film. At time the invention was made, it was well know to use pad is constructed by a laminated film to have an etching stopper film as an uppermost film.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made, for Akagawa to include in his invention that pad is constructed by a laminated film to have an etching stopper film as an uppermost film as taught by Osawa because Osawa teaches that such layer is necessary when etching of copper layer 21, Fig. 8A.

3.1.2. Regarding claim 3: Akagawa, as modified, discloses an electronic parts packaging structure having all of the claimed features as discussed above with respect claim 1,

except , Akagawa doesn't explicitly teach the connection pad is constructed by the laminated film selected from a group consisting of aluminum film/nickel film/copper film, aluminum film/nickel film/gold film, aluminum film/nickel film/copper film/gold film, aluminum film/nickel film/silver film, aluminum film/chromium film/copper film, aluminum film/conductive paste film, aluminum film/titanium film/conductive paste film, aluminum film/chromium film/conductive paste film, and aluminum film/titanium film/copper film, which are formed sequentially from a bottom respectively.

Osawa discloses in Fig.8 the connection pad is constructed by the laminated film selected from a group consisting of aluminum film 22/nickel film 23 /copper film 10 and (page 4, [0066]), aluminum film/nickel film/gold film, aluminum film/nickel film/copper film/gold film, aluminum film/nickel film/silver film, aluminum film/chromium film/copper film, aluminum film/conductive paste film, aluminum film/titanium film/conductive paste film, aluminum film 22 /chromium film 23 and 9/conductive paste film 10b and (page 5, [0077], page 4, [0065]), and aluminum film/titanium film/copper film, which are formed sequentially from a bottom respectively. At time the invention was made, it was well know to use the connection pad is constructed by the laminated film selected from a group consisting of aluminum film/nickel film/copper film, aluminum film/nickel film/gold film, aluminum film/nickel film/copper film/gold film, aluminum film/nickel film/silver film, aluminum film/chromium film/copper film, aluminum film/conductive paste film, aluminum film/titanium film/conductive paste film, aluminum film/chromium film/conductive paste film, and aluminum film/titanium film/copper film, which are formed sequentially from a bottom respectively.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made, for Akagawa to include in his invention that pad the connection pad is constructed by the laminated film selected from a group consisting of aluminum film/nickel film/copper film, aluminum film/nickel film/gold film, aluminum film/nickel film/copper film/gold film, aluminum film/nickel film/silver film, aluminum film/chromium film/copper film, aluminum film/conductive paste film, aluminum film/titanium film/conductive paste film, aluminum film/chromium film/conductive paste film, and aluminum film/titanium film/copper film, which are formed sequentially from a bottom respectively, motivated by its known suitability for its intended use. See MPEP §2144.07.

3.1.3. Regarding claim 4: Akagawa as modified, discloses an electronic parts packaging structure having all of the claimed features as discussed above with respect claim 1, wherein the mounted body 21, Fig.1 is a base substrate having a wiring pattern 27 thereon or a structural body in which an insulating film 22 and a wiring pattern 29, Fig. 1 are laminated by a predetermined number on the base substrate, and the wiring pattern 29 connected to the connection pad is connected electrically to the wiring patterns under the electronic parts via via holes 30 formed in the insulating films.

3.1.4. Regarding claim 5: Akagawa as modified, discloses an electronic parts packaging structure having all of the claimed features as discussed above with respect claim 4, wherein a plurality of electronic parts 40, Fig. 3 are packaged three-dimensionally in a state that the electronic parts 40 are buried in a plurality of insulating films 22, and the plurality of electronic parts are connected mutually via the via holes formed in the insulating films and the wiring pattern.

Although, Akagawa teaches (page 4, [0070]) to divide such device to plurality separated packages it obvious to one of ordinary skill in the art, at time the invention was made to use such device as whole unit namely electronic parts packaging structure with the plurality of electronic parts on it.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made for Akagawa to include in his invention the plurality of electronic parts are connected mutually.

3.1.5. Regarding claim 7: Akagawa as modified, discloses an electronic parts packaging structure having all of the claimed features as discussed above with respect claim 1, wherein a thickness of the electronic parts is set to about 150 .mu.m or less (page7, claim 5).

3.2. Claim 2 is rejected under 35U.S.C. 103(a) as being obvious over Akagawa in view of Osawa and in view of Akagawa et al. (Patent #5960308 hereinafter "Akagawa1").

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3.2.1. Regarding claim 2: Akagawa as modified, discloses an electronic parts packaging structure having all of the claimed features as discussed above with respect claim 1,

except , Akagawa doesn't explicitly teach the etching stopper film is a member selected from the group consisting of a copper film, a gold film, a silver film and a conductive paste film.

Akagawa1 discloses the etching stopper film is a member selected from the group consisting of a copper film (column 6, lines 36-39), a gold film, a silver film and a conductive paste film. At time the invention was made, it was well know to use the etching stopper film is a member selected from the group consisting of a copper film, a gold film, a silver film and a conductive paste film.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made, for Akagawa to include in his invention that the etching stopper film is a member selected from the group consisting of a copper film, a gold film, a silver film and a conductive paste film to provide laser beam shielding layer.

3.3. Claim 6 is rejected under 35U.S.C. 103(a) as being obvious over Akagawa in view of Osawa and in view of Ho et al. (Patent #2003/0218249 hereinafter "Ho").

3.3.1. Regarding claim 6: Akagawa as modified, discloses an electronic parts packaging structure having all of the claimed features as discussed above with respect claim 1, wherein [a bump of an overlying electronic parts is mounted on the] wiring pattern 29, Fig.1 is connected to the connection pad of the electronic parts 40 (page 3,[0045]),

except , Akagawa doesn't explicitly teach a bump of an overlying electronic parts is mounted on the wiring pattern by a flip-chip mounting.

Ho discloses Fig. 4 a bump 320 of an overlying electronic parts 300 is mounted on the wiring pattern 260 and 130 by a flip-chip mounting. At time the invention was made, it was well know to use a bump of an overlying electronic parts is mounted on the wiring pattern which is connected to the connection pad of the electronic parts by a flip-chip mounting.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made, for Akagawa to include in his invention that a bump of an overlying

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electronic parts is mounted on the wiring pattern which is connected to the connection pad of the electronic parts by a flip-chip mounting to provide easy assembly.

4.1. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yuriy Semenenko whose telephone number is (571) 272-6106. The examiner can normally be reached on 8:30am - 5:00pm.

4.2. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamand Cuneo can be reached on (571)- 272-1957. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

4.3. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

YS


KAMAND CUNEO
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800